ABSTRACT

METHOD FOR FUNCTIONALIZING CARBON NANOTUBES UTILIZING PEROXIDES

A method for functionalizing the wall of single-wall or multi-wall carbon nanotubes involves the use of acyl peroxides to generate carbon-centered free radicals. The method allows for the chemical attachment of a variety of functional groups to the wall or end cap of carbon nanotubes through covalent carbon bonds without destroying the wall or endcap structure of the nanotube. Carbon-centered radicals generated from acyl peroxides can have terminal functional groups that provide sites for further reaction with other compounds. Organic groups with terminal carboxylic acid functionality can be converted to an acyl chloride and further reacted with an amine to form an amide or with a diamine to form an amide with terminal amine. The reactive functional groups attached to the nanotubes provide improved solvent dispersibility and provide reaction sites for monomers for incorporation in polymer structures. The nanotubes can also be functionalized by generating free radicals from organic sulfoxides.